



National Center for Science and  
Engineering Statistics

## Survey

# Higher Education Research and Development Survey (HERD) | 2021

The HERD Survey is the primary source of information on research and development expenditures at U.S. colleges and universities that expended at least \$150,000 in separately accounted for R&D in the fiscal year.

## Survey Description

## Survey Description

---

### Survey Overview (FY 2021 survey cycle)

#### Purpose

The Higher Education Research and Development (HERD) Survey is the primary source of information on separately accounted for research and development (R&D) expenditures within higher education institutions in the United States and outlying areas.

#### Data collection authority

The information is solicited under the authority of the National Science Foundation Act of 1950, as amended, and the America COMPETES Reauthorization Act of 2010. The Office of Management and Budget control number is 3145–0100, with an expiration date of 31 August 2022. The survey is sponsored by the National Center for Science and Engineering Statistics (NCSES) within the National Science Foundation (NSF).

#### Major changes to recent survey cycle

No major changes were made to the FY 2021 survey.

### Key Survey Information

<b>Frequency</b>	Annual.
<b>Initial survey year</b>	In 2010, the HERD Survey replaced a previous annual collection, the NSF Survey of Research and Development Expenditures at Universities and Colleges (Academic R&D Expenditures Survey), which was conducted from FY 1972 through FY 2009.
<b>Reference period</b>	The academic fiscal year ending in 2021; for most institutions this was 1 July 2020 to 30 June 2021.
<b>Response unit</b>	Establishment; U.S. academic institutions reporting at least \$150,000 in R&D expenditures in the previous fiscal year.
<b>Sample or census</b>	Census.
<b>Population size</b>	A total of 910 institutions.
<b>Sample size</b>	The survey was a census of all known eligible universities and colleges.
<b>Key variables</b>	<p>Key variables of interest are listed below.</p> <ul style="list-style-type: none"><li>• R&amp;D expenditures by field and source of funds (i.e., federal government, state and local government, business, nonprofit, institutional, and other)</li><li>• R&amp;D expenditures funded from foreign sources</li><li>• R&amp;D expenditures within medical schools</li><li>• Clinical trial R&amp;D expenditures (Phases I–III)</li></ul>

- R&D expenditures by type of R&D (i.e., basic research, applied research, and experimental development)
- Total and federally funded R&D expenditures passed through to subrecipients or received as a subrecipient
- Federally funded R&D expenditures by field and federal agency
- R&D expenditures by cost categories (e.g., salaries, software, equipment, indirect costs)
- Total and federally funded R&D equipment expenditures by field
- Headcounts and full-time equivalents of R&D personnel functions (researchers, R&D technicians, and R&D support staff)
- Institutional characteristics (i.e., highest degree granted, historically Black college or university [HBCU], high Hispanic enrollment [HHE], public or private control)
- Geographic location within the United States

## Survey Design

### Target population

Public and private nonprofit postsecondary institutions in the United States, Guam, Puerto Rico, and the U.S. Virgin Islands that granted a bachelor's degree or higher in any field, expended at least \$150,000 in separately accounted for R&D in FY 2021, and were geographically separate campuses headed by a president, chancellor, or equivalent.

### Sampling frame

The survey is a census of all eligible institutions as defined above. In the FY 2021 cycle, there were 910 academic institutions surveyed.

### Sample design

Not applicable.

## Data Collection and Processing

### Data collection

The FY 2021 survey was conducted by ICF under contract to NCSES. Surveys were distributed to designated contacts at each institution. The data collection period was from December 2021 through August 2022. Respondents submitted their data using a Web-based data collection system. Telephone and e-mail were used for follow-up contacts with respondents.

### Data processing

Respondents were contacted and asked to resolve possible self-reporting issues themselves. Questionnaires were carefully examined by survey staff upon receipt. Reviews focused on unexplained missing data and explanations provided for changes in reporting patterns. If additional explanations or data revisions were needed, respondents were sent personalized e-mail messages asking them to provide any necessary revisions before the final processing and tabulation of data.

### Estimation techniques

Missing values were imputed based on the previous year's data and the reported data of peer institutions in the current cycle.

## Survey Quality Measures

### Sampling error

Not applicable.

### Coverage error

Coverage error of large research institutions is minimal because comprehensive lists exist. These institutions are easily identified using the NCSSES Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions. However, institutions with smaller amounts of R&D expenditures have been more difficult to identify because they often do not receive federal funding for R&D.

NCSSES annually screens all 4-year and above institutions reporting nonzero amounts of research expenses to the Department of Education Integrated Postsecondary Education Data System (IPEDS) to determine if new institutions qualify for inclusion in the survey.

### Nonresponse error

The unit nonresponse was 4.9% in FY 2021. The item nonresponse rates for questions recurring from FY 2019 varied from 0.0% for Question 1, total R&D expenditures by source of funds; Question 9, federal expenditures by R&D field; and for Question 11, R&D expenditures from nonfederal sources, to 6.8% for Question 6, R&D expenditures by type of R&D (basic research, applied research, and experimental development). Questions 15 and 16, which were new or greatly revised from FY 2019, had nonresponse rates of 13.4% and 32.6% respectively.

### Measurement error

Potential sources of measurement errors include incomplete administrative data or differing categories used by the institutions.

## Data Availability and Comparability

### Data availability

Annual data are available for FYs 1972–2021.

### Data comparability

When the review for consistency between each year's data and submissions in prior years reveals discrepancies, it is sometimes necessary to modify prior years' data. This is especially likely to affect trends for certain institutions that fail to report every year, because current-year data are used to impute prior-year data.

For accurate historical data, use only the most recently released data tables. Individuals wishing to analyze trends other than those in the most recent data tables are encouraged to contact the Survey Manager for more information about comparability of data over time.

## Data Products

### Publications

Data tables from this survey are published annually in the series *Higher Education Research and Development*. The most recent report in this series is available at <http://www.nsf.gov/statistics/srvyherd/>. Information from this survey is also included in *Science and Engineering Indicators*.

## Electronic access

Microdata beginning with the FY 2010 survey are available in NCSES's [interactive data tool](#). Public use files beginning with the FY 1972 are available at [http://www.nsf.gov/statistics/herd/pub\\_data.cfm](http://www.nsf.gov/statistics/herd/pub_data.cfm).